

1/35
SEQUENCE LISTING

5 <110> Biotica Technology Limited
 Pfizer Inc
 Gaisser, Sabine

10 <120> Polyketides and their synthesis
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 <150> GB0327721.7
 <151> 2003-11-28

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 <170> PatentIn version 3.2

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40 Leu Met Leu Ala Gly Ile Arg Glu Ile Gln Ile Ile Ser Ser Lys Asp
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45 His Leu Asp Leu Phe Arg Ser Leu Leu Gly Glu Gly Asp Arg Leu Gly
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50 Leu Ser Ile Ser Tyr Ala Glu Gln Arg Glu Pro Arg Gly Ile Ala Glu
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60 Ile Leu Gly Asp Asn Val Phe His Gly Pro Gly Phe Ser Ser Val Leu
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Val Lys Asp Ala His Arg Tyr Gly Val Gly Glu Ile Asp Ser Gly Gly

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 30 Thr Gly Thr Val Ala Arg Leu Asp Gly Cys Glu Leu Phe Gly Tyr Pro
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 35 Val Lys Asp Ala His Arg Tyr Gly Val Gly Glu Ile Asp Ser Gly Gly
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 40 Arg Leu Leu Ser Leu Glu Glu Lys Pro Arg Arg Pro Leu Glu Pro Gly
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 45 Arg His Arg Leu Tyr Leu Tyr Thr Asn Asp Val Val Glu Ile Ala Arg
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 50 Thr Ile Ser Pro Ser Ala Arg Gly Glu Leu Glu Ile Thr Asp Val Asn
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 55 Lys Val Tyr Leu Glu Gln Gly Arg Ala Ala His Gly Ala Gly Ala Val
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 60 Val Ala Trp Leu Asp Met Gly Thr His Asp Ser Leu Leu Gln Ala Gly
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 65 Gln Tyr Val Gln Leu Leu Glu Gln Arg Gln Gly Glu Arg Ile Ala Cys
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 70 Ile Glu Glu Ile Ala Met Arg Met Gly Phe Ile Ser Ala Glu Gln Cys
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 <213> Streptomyces fradiae

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30 Ala Asp Gln Ala Leu Val Arg Arg Leu Met Glu Gly Val Gly Leu Val
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40 Ala Ala Val Asp Ala Gly Val Gly Arg Phe Val His Ile Ser Thr Asp
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Leu Ala Leu Ala Tyr His Arg Thr Tyr Gly Leu Asp Val Arg Val Thr
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55 Arg Cys Ser Asn Asn Tyr Gly Pro Arg Gln Tyr Pro Glu Lys Ala Val
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60 Pro Leu Phe Thr Thr Asn Leu Leu Asp Gly Leu Pro Val Pro Leu Tyr
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20 Asp Arg Pro Gly His Asp Arg Arg Tyr Ser Val Asp Thr Thr Lys Ile
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25 Arg Glu Glu Leu Gly Tyr Ala Pro Arg Thr Gly Ile Thr Glu Gly Leu
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Ala Asp His Gly Trp Trp Arg Arg Leu Met Glu Gly Val Gly Leu Val
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40	ctgcacttcc	gcctcggcgg	gcccctggtc	ggaacggctc	ccgaagccgc	gctcgggtgc	1200
	ctggccgcac	ggctccccgg	tctgcgcgcc	gcggggccgg	ccgtgcggcg	ccgcgcctca	1260
45	ccggtgctgc	acggacacgc	ccgcctcccc	gtcgccgctc	cccgacgggc	ccgtgacctg	1320
	cccgccaccg	caccgcggaa	ctgaggaggg	agtgccccga	tgcgtatcct	gctgaogtcg	1380
	ttcgcgacac	acacgcacta	ctacaacctg	gtccccctcg	gctgggcgct	gcgcgcgcc	1440
50	gggcacgacg	tacgggtcgc	cagccagccc	tcgctgaccg	gcaccatcac	cggtccggg	1500
	ctgaccgccg	tccccgtggg	cgacgacacg	gccatcgctc	agctgatcac	cgagatcggc	1560
55	gacgacctcg	tcctctacca	gcagggcacg	gacttcgtgg	acaccgcgga	cgagccgctg	1620
	tcctgggaac	acgccctcgg	acagcagacg	atcatgtcgg	ccatgtgctt	ctcgccgctg	1680
	aacggcgaca	gcaccatcga	cgacatgggtg	gcgctggccc	gttcttgga	accggacctc	1740
60	gtcctgtggg	agcccttcac	ctacgcggga	cccgtcgccg	cgcacgcctg	cgccgcgcc	1800

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	cacgcccggc	tgctgtgggg	tcccgaactg	gtcctcaacg	cacggcggca	gttcacccgg	1860
	ctgctcgccg	agcgccccgt	cgaacagcgc	gaggacccgg	tcggcgaatg	gctcacgtgg	1920
5	acgctggagc	gccacggcct	cgccgcccgc	gcggacacga	tcgaggaact	gttcgcccgg	1980
	cagtggacga	tcgaccccag	cgccgggagc	ctgcggctgc	cggtcgacgg	cgaggtcgtg	2040
10	cccatgcgct	tcgtgccgta	caacggcgcc	tcggtcgtcc	ccgcctggct	ctccgagccg	2100
	cctgcccggc	cccgggtctg	cgtcaccctc	ggcgtctcca	cccgggagac	ctacggcacg	2160
	gacggcgctc	cgttccacga	actgctggcc	ggactggccg	acgtggacgc	cgagatcgtc	2220
15	gccaccctcg	acgcggggca	gctcccggac	gccgcccgtc	tgcccggcaa	tgtgcgcgtc	2280
	gtcgacttcg	tgccgctgga	cgccctgctg	ccgagctgcg	ccgcgatcgt	ccaccacgga	2340
20	ggcgcgggaa	cctgtttcac	ggccaccgtg	cacggcgctc	cgcagatcgt	cgtggcctcc	2400
	ctctgggacg	cgccgctgaa	ggcgcaacca	ctcgccgagg	cgggcgcggg	gacgcgccctg	2460
	gaccccgggg	aactgggcgt	ggacaccctg	cgcggcggcg	tcgtgcgggt	gctggagagc	2520
25	cgcgagatgg	ccgtggcggc	ggctgcctc	gccgacgaga	tgctcgccgc	ccccaccccg	2580
	gccgcgctcg	tccccgcct	cgaacgcctc	accgccgcgc	accgccgcgc	ctgatcccg	2640
30	caaggagccc	ccatgaacct	cgaatacagc	ggcgacatcg	cccggttgta	cgacctggtc	2700
	caccagggaa	agggcaagga	ctaccgggcg	gaggccgagg	agctggccgc	gcttgtcacc	2760
	cagcgccgcc	ccggggcccg	ctccctcctc	gacgtggcct	gcggaacggg	gatgcacctg	2820
35	cggcacctcg	gcgacctctt	cgaggagggtg	gccgggggtg	agatgtcccc	cgacatgctg	2880
	gccatcgcg	agcggcgcaa	cccgaggagg	ggcatccacc	ggggggacat	gcgggacttc	2940
40	gccctcggcc	gccgcttcga	cgccgtgatc	tgcatgttca	gttccatcgg	gcacatgcgc	3000
	gaccagcggg	aactggacgc	ggcgatcggc	cggttcgccg	cgcacctgcc	gtccggcggg	3060
	gtcgtgatcg	tcgatccctg	gtggttcccc	gagacgttca	caccggggta	cgtcggcgcg	3120
45	agcctcgctg	aggccgagg	ccgcaccatc	gcgcgcttct	cccactccgc	gctcgaggac	3180
	ggcgcgaccc	ggatcgatgt	ggactacctc	gtcggcgctg	cgggggaggg	ggtgcggcac	3240
50	ttgaaggaga	cccatcggat	cacgcttttc	gggcgtgcgc	agtacgaggc	ggccttcacc	3300
	gcggcgggga	tgtccgtcga	gtacctcccg	cacgccgcca	ccgaccgcgg	actcttcgtc	3360
	ggcgtccagg	cctga					3375
55							
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	<211>	295					
	<212>	PRT					
	<213>	Streptomyces eurythermus					
60	<400>	8					

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Met Lys Gly Ile Ile Leu Ala Gly Gly Ser Gly Thr Arg Leu Arg Pro
 1 5 10 15
 5
 Leu Thr Gly Ala Leu Ser Lys Gln Leu Leu Pro Val Tyr Asp Lys Pro
 20 25 30
 10
 Met Ile Tyr Tyr Pro Leu Ser Val Leu Met Leu Ala Gly Ile Arg Asp
 35 40 45
 15
 Ile Gln Ile Ile Thr Ser Lys Thr His Leu Glu Met Phe Arg Ser Leu
 50 55 60
 20
 Leu Gly Asp Gly Ser Arg Ile Gly Ile Ser Val Gly Tyr Ala Glu Gln
 65 70 75 80
 25
 Glu Glu Pro Arg Gly Ile Ala Glu Ala Phe Leu Ile Gly Glu Glu His
 85 90 95
 30
 Ile Gly Asp Asp Pro Val Ala Leu Ile Leu Gly Asp Asn Val Phe His
 100 105 110
 35
 Gly Pro Gly Phe Ser Ser Val Leu Ala Ser Thr Ala Ala Arg Leu Asp
 115 120 125
 40
 Gly Cys Glu Leu Phe Gly Tyr Pro Val Lys Asp Pro Arg Arg Tyr Gly
 130 135 140
 45
 Val Gly Glu Val Asp Ala Glu Gly Arg Leu Val Ser Leu Glu Glu Lys
 145 150 155 160
 50
 Pro Glu Lys Pro Arg Ser His Leu Ala Val Thr Gly Leu Tyr Phe Tyr
 165 170 175
 55
 Asp Asn Gly Val Val Asp Ile Ala Arg Arg Leu Thr Pro Ser Pro Arg
 180 185 190
 60
 Gly Glu Leu Glu Ile Thr Asp Val Asn Lys Val Tyr Leu Glu Gln Gly
 195 200 205
 65
 Arg Ala Arg Met Thr Glu Leu Gly Arg Gly Phe Ala Trp Leu Asp Met
 210 215 220
 70
 Gly Thr His Ser Ser Leu Leu Gln Ala Gly Gln Tyr Val Gln Leu Leu
 225 230 235 240

14/35

Glu Gln Arg Gln Gly Val Arg Ile Ser Cys Val Glu Glu Ile Ala Leu
 245 250 255

5 Arg Met Gly Tyr Ile Ser Ala Arg Gln Cys His Glu Leu Gly Arg Glu
 260 265 270

10 Leu Glu Ser Ser Ser Tyr Gly Arg Tyr Leu Met Asp Val Ala Glu Thr
 275 280 285

15 Leu Met Ser Gly Pro Ala Ala
 290 295

<210> 9
 <211> 332
 <212> PRT
 20 <213> Streptomyces eurythermus
 <400> 9

25 Met Arg Leu Leu Val Thr Gly Gly Ala Gly Phe Ile Gly Ser His Phe
 1 5 10 15

30 Val Arg Gln Leu Leu Ala Gly Ala Tyr Pro Asp Leu Ala Gly Ala Arg
 20 25 30

Thr Val Val Val Asp Lys Leu Thr Tyr Ala Gly Asn Leu Ala Asn Leu
 35 35 40 45

40 Asp Pro Val Ala Asp His Pro Ser Leu Glu Phe Val His Ala Asp Ile
 50 55 60

45 Arg Asp Ala Glu Val Met Ser Arg Val Val Arg Gly Ala Asp Val Val
 65 70 75 80

Val His Phe Ala Ala Glu Ser His Val Asp Arg Ser Ile Ala Asp Ala
 85 90 95

50 Ser Ala Phe Val Glu Thr Asn Val Arg Gly Thr Gln Val Leu Leu Gln
 100 105 110

Ala Ala Val Glu Ala Gly Ala Gly Arg Phe Val His Val Ser Thr Asp
 115 120 125

55 Glu Val Tyr Gly Ser Ile Ala Glu Gly Ser Trp Arg Glu Glu Gln Pro
 130 135 140

60 Leu Ala Pro Asn Ser Pro Tyr Ala Ala Ser Lys Ala Ala Ser Asp Leu
 145 150 155 160

15/35

5 Leu Ala Leu Ala Tyr His Arg Thr Tyr Gly Leu Pro Val Val Val Thr
 165 170 175
 Arg Cys Ser Asn Asn Tyr Gly Pro Tyr Gln His Pro Glu Lys Val Val
 180 185 190
 10 Pro Leu Phe Ala Thr Asn Leu Leu Asp Gly Leu Thr Val Pro Leu Tyr
 195 200 205
 15 Ser Asp Gly Gly Asn Ser Arg Asp Trp Leu His Val Asp Asp His Cys
 210 215 220
 20 Arg Gly Ile Ser Leu Val Ala Thr Arg Gly Arg Pro Gly Glu Val Tyr
 225 230 235 240
 25 His Ile Gly Gly Gly Thr Glu Leu Thr Asn Arg Glu Leu Thr Lys Arg
 245 250 255
 Leu Leu Gly Leu Cys Gly Ala Asp Ala Ser Ser Val Arg His Val Ala
 260 265 270
 30 Asp Arg Pro Gly His Asp Leu Arg Tyr Ala Leu Asp Ile Gly Lys Ile
 275 280 285
 35 Thr Gly Glu Leu Gly Tyr Ala Pro Arg Thr Asp Phe Thr Thr Gly Leu
 290 295 300
 40 Ala Asp Thr Val Arg Trp Tyr Ala Glu Asn Arg Ala Trp Trp Glu Pro
 305 310 315 320
 45 Leu Lys Lys Ala Ala Gln Glu Ala Arg Arg Thr Asp
 325 330
 <210> 10
 <211> 787
 <212> PRT
 50 <213> Streptomyces eurythermus
 <400> 10
 55 Val Ser Thr Pro Ser Ala Pro Pro Val Pro Gly Ala Pro Ser Pro Ala
 1 5 10 15
 60 Gly His Pro Asp Glu Gly Leu Trp Val Arg Arg Tyr Arg Pro Val Arg
 20 25 30

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	Asp	Pro	Glu	Leu	Arg	Leu	Val	Cys	Phe	Pro	His	Ala	Gly	Gly	Ala	Ala	
			35					40					45				
5	Thr	Ser	Phe	Ala	Ala	Leu	Ala	Arg	Gly	Leu	Asp	Glu	Thr	Val	Glu	Ala	
		50					55					60					
10	Leu	Ala	Val	Gln	Tyr	Pro	Gly	Arg	Gln	Asp	Arg	Arg	His	Glu	Pro	Phe	
	65					70					75					80	
15	Ile	Pro	Ser	Ile	Ser	Gly	Leu	Val	Asp	Gln	Val	Val	Pro	Glu	Ile	Leu	
				85						90					95		
20	Arg	Trp	Ala	Asp	Arg	Pro	Leu	Ala	Leu	Phe	Gly	His	Ser	Met	Gly	Ala	
				100					105					110			
25	Thr	Val	Ala	Phe	Glu	Val	Ala	Arg	Arg	Leu	Arg	Gly	Ser	Gly	Gln	Ala	
			115					120					125				
30	Ser	Pro	Val	His	Leu	Leu	Val	Ser	Gly	Arg	Arg	Ala	Pro	Thr	Val	Arg	
		130					135					140					
35	Arg	Arg	Asp	Val	Ala	His	Leu	Leu	Asp	Asp	Asp	Ala	Leu	Ile	Ala	Glu	
	145					150					155					160	
40	Ile	Ala	Thr	Leu	Gln	Gly	Thr	Glu	Asp	Ala	Val	Leu	Gln	Asp	Glu	Glu	
				165						170					175		
45	Leu	Leu	Arg	Leu	Ala	Leu	Pro	Ala	Ile	Arg	Asn	Asp	Tyr	Arg	Ala	Ala	
				180					185					190			
50	Gly	Thr	Tyr	Ala	Tyr	Val	Pro	Gly	Gly	Ala	Leu	Asp	Cys	Pro	Val	Thr	
			195					200					205				
55	Val	Leu	Thr	Gly	Asp	Arg	Asp	Pro	Asp	Val	Pro	Leu	Glu	Glu	Ala	Arg	
		210					215					220					
60	Ala	Trp	Arg	Glu	Leu	Thr	Thr	Gly	Pro	Phe	Ala	Leu	His	Thr	Phe	Ala	
	225					230					235					240	
65	Gly	Gly	His	Phe	Tyr	Leu	Asn	Asp	Arg	Met	Asp	Glu	Val	Cys	Arg	Thr	
					245					250					255		
70	Ile	Gly	Asp	Ala	Leu	Ala	Gly	Thr	Ala	Thr	Ala	Asp	Thr	Ala	Thr	Gly	
				260					265					270			
75	Thr	Val	Pro	Pro	Arg	Thr	Ala	Ala	Asp	Thr	Ser	Thr	Gly	Pro	Val	Pro	

17/35

275

280

285

5 Pro Arg Thr Ala Ala Asp Thr Ala Arg Glu Pro Val Pro Pro Arg Ser
 290 295 300

10 Ala Pro Ala Pro His Gly Ala Ala Arg Arg Arg Ala Asp Ala Val Arg
 305 310 315 320

15 Pro Gly Asp Pro Val Asp Thr Ala Arg Arg Val Leu Val Ser Ala Arg
 325 330 335

20 Thr Ala Asp Ser Ala Val Thr Pro Phe Asp Gly Ile Ser Gly Trp Leu
 340 345 350

25 Ala Glu Arg Leu Arg Ala Gly Arg Phe Asp Val Ser Arg Val Pro Phe
 355 360 365

30 Ala Glu Leu Arg Gly Trp Ser Phe His Pro Gly Thr Gly Asn Leu His
 370 375 380

35 His Ala Ser Gly Arg Phe Phe Ser Val Glu Gly Leu His Val Arg Thr
 385 390 395 400

40 Asp Arg Leu Pro Glu Arg Gly Trp Thr Gln Pro Ile Ile Val Gln Pro
 405 410 415

45 Glu Val Gly Leu Leu Gly Ile Val Ala Arg Glu Ile Asp Gly Val Leu
 420 425 430

50 His Phe Leu Met Gln Ala Lys Met Glu Pro Gly Asn Val Asn Val Leu
 435 440 445

55 Gln Val Ser Pro Thr Val Gln Ala Thr Arg Ser Asn Phe Thr Gly Val
 450 455 460

60 His Arg Gly Arg Asp Ile Arg Tyr Leu Asp Leu Phe Met Gly Pro Arg
 465 470 475 480

Arg Ala Arg Val Leu Val Asp Ser Ile Gln Ser Glu Gln Ala Asp Trp
 485 490 495

65 Phe Leu Ala Lys Arg Asn Arg Asn Met Ile Val Glu Leu Ala Ala Asp
 500 505 510

70 Asp Asp Leu Asp Ile Gly Glu Asp Phe Arg Trp Leu Thr Leu Gly Gln
 515 520 525

18/35

5 Leu Arg Arg Leu Leu Met Leu Asp Asn Val Val Asn Met Asp Ala Arg
 530 535 540
 Ser Ile Leu Ala Cys Leu Pro Thr Ala Asp Ala Asp Ala Ser Ala Pro
 545 550 555 560
 10 Ser Pro Val Leu Arg Ser Phe Phe Gly Ser Pro Gly Ala Ala Arg His
 565 570 575
 15 Thr Thr Ala Glu Val Leu Thr Trp Phe Thr Gly Val Arg Ala Leu Arg
 580 585 590
 20 Glu Leu Val Gln Asn Arg Val Pro Leu Asp Thr Val Thr Ala Asp Gly
 595 600 605
 25 Trp Tyr Arg Thr Pro His Glu Ile Ala His Glu Ser Gly Arg His Phe
 610 615 620
 Arg Val Met Ala Ala Glu Val Ser Ala Ser Ser Arg Glu Val Thr Ser
 625 630 635 640
 30 Trp Thr Gln Pro Leu Ile Glu Pro Arg Leu Pro Gly Leu Met Ala Leu
 645 650 655
 35 Leu Val Lys Ser Val Asp Gly Val Leu His Ala Leu Val Arg Ala Arg
 660 665 670
 40 Val Asp Val Gly His Leu Asn Val Ala Glu Leu Ala Pro Thr Val Gln
 675 680 685
 45 Cys Arg Pro Gln Glu His Thr Gly Pro Arg Gly Leu Pro Gly Pro Pro
 690 695 700
 Tyr Leu Glu Asp Val Leu Ser Ala Pro Pro Gln Asp Val Arg Tyr Asp
 705 710 715 720
 50 Ala Val Gln Ser Glu Glu Gly Gly Arg Phe Phe His Ala Gln Asn Arg
 725 730 735
 55 Tyr Val Ile Val Glu Val Pro His Asp Phe Pro Glu Asp Ala Pro Asp
 740 745 750
 60 Asp Phe Ala Trp Leu Ser Leu Gly Gln Leu Thr Gly Leu Leu Ala His
 755 760 765

19/35

Gly Asn Tyr Leu Asn Ile Glu Leu Arg Thr Leu Val Ala Cys Ala His
 770 775 780

5

Thr Leu Tyr
785

10

<210> 11
 <211> 333
 <212> PRT
 <213> Streptomyces eurythermus

15

<400> 11

Met Val Asn Asp Pro Met Pro Arg Gly Ser Gly Ser Gly Ser Val Val
1 5 10 15

20

Val Leu Gly Gly Ala Gly Tyr Val Gly Arg His Val Cys Ala Ala Phe
20 25 30

25

Ala Ala Arg Gly Arg Asp Val Val Val Val Gly Arg Arg Pro Pro Glu
35 40 45

30

Glu Pro Met Pro Tyr Arg Cys Val Thr Leu Asp Leu Ala Gly Thr Asp
50 55 60

35

Pro Ala Ala Leu Ala Ala Ala Leu Asp Ala Glu Arg Pro Asp Thr Ile
65 70 75 80

Val Asn Ser Val Gly Ser Ile Trp Gly Arg Thr Asp Glu Gln Met Trp
85 90 95

40

Ser Ala Thr Ala Val Pro Thr Leu Arg Leu Leu Glu Ala Leu Ala Leu
100 105 110

45

Met Ser Ala Arg Pro Arg Leu Val His Leu Gly Ser Val Leu Glu Tyr
115 120 125

50

Gly Pro Val Thr Pro Gly Gly Ser Val Gly Ala Asp Ala Val Pro Arg
130 135 140

55

Pro Asp Thr Ala Tyr Gly Arg Ser Lys Leu Ala Ala Ser Glu Ala Val
145 150 155 160

Leu Arg Gly Thr Ser Gly Gly Trp Val Asp Gly Val Val Leu Arg Val
165 170 175

60

Ser Asn Val Ser Gly Pro Gly Thr Pro Arg Ile Ser Leu Leu Gly Gln

20/35

180

185

190

5 Val Ala Glu Arg Leu Leu Ala Ala Ala Gly Thr Gly Ala Glu Ala Val
195 200 205

10 Val Glu Leu Ser Arg Leu Arg Ala His Arg Asp Tyr Val Asp Val Arg
210 215 220

15 Asp Val Ala Asp Ala Val Val Ala Ala Ala Arg Ala Pro Ala Val Pro
225 230 235 240

Val Ala Val Gly Ile Gly Arg Gly Glu Ala Val Ala Val Arg Asp Leu
245 250 255

20 Val Gly Leu Phe Ile Glu Ala Ser Gly Ile Pro Ala Arg Val Val Glu
260 265 270

25 Arg Pro Ala Pro Gly Arg Ala Pro Gly His Arg Glu Asp Trp Leu Arg
275 280 285

30 Val Asp Thr Gly Ala Ala Arg Ala Leu Leu Gly Trp Ala Pro Arg Arg
290 295 300

Ser Leu Arg Glu Ser Val Arg Asp Cys Trp His Asp Leu Val Arg Ala
305 310 315 320

35 His Arg Leu Pro Thr Thr Pro Ser Lys His Ser Gly Gly
325 330

40 <210> 12
<211> 373
<212> PRT
<213> Streptomyces eurythermus

45 <400> 12

Val Thr Thr Tyr Val Trp Asp Tyr Leu Ala Glu Tyr Gln Asn Glu Arg
1 5 10 15

50 Ala Asp Leu Leu Asp Ala Val Glu Thr Val Phe Ala Ser Gly Gln Leu
20 25 30

55 Val Leu Gly Pro Ser Val Asp Gly Phe Glu Lys Glu Phe Ala Asp Tyr
35 40 45

60 His Gly Leu Arg His Cys Gly Gly Val Asp Asn Gly Thr Asn Ala Val
50 55 60

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Lys Leu Gly Leu Gln Ala Leu Gly Val Gly Pro Gly Asp Glu Val Val
 65 70 75 80
 5 Thr Val Ser Asn Thr Ala Ala Pro Thr Val Val Ala Ile Asp Gly Thr
 85 90 95
 10 Gly Ala Thr Pro Val Phe Val Asp Val Arg Ala Glu Asp His Leu Met
 100 105 110
 15 Asp Thr Asp Gln Val Ala Asp Val Ile Thr Pro Arg Thr Lys Ala Leu
 115 120 125
 20 Leu Pro Val His Leu Tyr Gly Gln Cys Val Asp Met Ala Pro Leu Arg
 130 135 140
 Ala Leu Ala Glu Gln His Gly Leu Val Val Leu Glu Asp Cys Ala Gln
 145 150 155 160
 25 Ala His Gly Ala Arg His His Gly Glu Leu Ala Gly Thr Leu Gly Asp
 165 170 175
 30 Ala Ala Ala Phe Ser Phe Tyr Pro Thr Lys Val Leu Gly Ala Tyr Gly
 180 185 190
 35 Asp Gly Gly Ala Val Leu Thr Asp Asp Ala Asp Val Asp Arg Ala Leu
 195 200 205
 40 Arg Arg Leu Arg Tyr Tyr Gly Met Glu Asp Val Tyr Tyr Val Val Gln
 210 215 220
 Thr Pro Gly His Asn Ser Arg Leu Asp Glu Val Gln Ala Glu Ile Leu
 225 230 235 240
 45 Arg Arg Lys Leu Thr Arg Leu Asp Arg Tyr Ile Glu Gly Arg Arg Ala
 245 250 255
 50 Val Ala Arg Arg Tyr Ala Glu Gly Leu Ala Asn Leu Thr Gly Pro Gly
 260 265 270
 55 Gly Leu Val Leu Pro Ser Val Thr Glu Gly Asn Asp His Val Tyr Tyr
 275 280 285
 60 Val Tyr Val Val Arg His Pro Arg Arg Asp Asp Ile Ile Glu Ala Leu
 290 295 300

22/35

Lys Ser Tyr Gly Ile Ser Leu Asn Ile Ser Tyr Pro Trp Pro Val His
 305 310 315 320

5 Thr Met Thr Gly Phe Ala His Leu Gly Tyr Ala Lys Gly Ser Leu Pro
 325 330 335

10 Val Thr Glu Arg Leu Ala Asp Glu Ile Phe Ser Leu Pro Met Tyr Pro
 340 345 350

15 Gly Leu Ala Pro Asp Val Gln Asp Lys Val Ile Ala Ala Leu His Glu
 355 360 365

Val Leu Ala Thr Leu
 370

20 <210> 13
 <211> 447
 <212> PRT
 <213> Streptomyces eurythermus

25 <400> 13

30 Val Ser Pro Ala Pro Ala Thr Glu Asp Pro Ala Ala Ala Gly Arg Arg
 1 5 10 15

Leu Gln Leu Thr Arg Ala Ala Gln Trp Phe Ala Gly Thr Gln Asp Asp
 20 25 30

35 Pro Tyr Ala Leu Val Leu Arg Ala Glu Ala Thr Asp Pro Ala Pro Tyr
 35 40 45

40 Glu Glu Arg Ile Arg Ala His Gly Pro Leu Phe Arg Ser Asp Leu Leu
 50 55 60

45 Asp Thr Trp Val Thr Ala Ser Arg Ala Val Ala Asp Glu Val Ile Thr
 65 70 75 80

50 Ser Pro Ala Phe Asp Gly Leu Thr Ala Asp Gly Arg Arg Pro Gly Ala
 85 90 95

Arg Glu Leu Pro Leu Ser Gly Thr Ala Leu Asp Ala Asp Arg Ala Thr
 100 105 110

55 Cys Ala Arg Phe Gly Ala Leu Thr Ala Trp Gly Gly Pro Leu Leu Pro
 115 120 125

60 Ala Pro His Glu Arg Ala Leu Arg Glu Ser Ala Glu Arg Arg Ala His
 130 135 140

23/35

5 Thr Leu Leu Asp Gly Ala Glu Ala Ala Leu Ala Ala Asp Gly Thr Val
 145 150 155 160
 Asp Leu Val Asp Ala Tyr Ala Arg Arg Leu Pro Ala Leu Val Leu Arg
 165 170 175
 10 Glu Gln Leu Gly Val Pro Glu Glu Ala Ala Thr Ala Phe Glu Asp Ala
 180 185 190
 15 Leu Ala Gly Cys Arg Arg Thr Leu Asp Gly Ala Leu Cys Pro Gln Leu
 195 200 205
 20 Leu Pro Asp Ala Val Ala Gly Val Arg Ala Glu Ala Ala Leu Thr Ala
 210 215 220
 25 Val Leu Ala Ser Ala Leu Arg Gly Thr Pro Ala Gly Arg Ala Pro Asp
 225 230 235 240
 Ala Val Ala Ala Ala Arg Thr Leu Ala Val Ala Ala Ala Glu Pro Ala
 245 250 255
 30 Ala Thr Leu Val Gly Asn Ala Val Gln Glu Leu Leu Ala Arg Pro Ala
 260 265 270
 35 Gln Trp Ala Glu Leu Val Arg Asp Pro Arg Leu Ala Ala Ala Ala Val
 275 280 285
 40 Thr Glu Thr Leu Arg Val Ala Pro Pro Val Arg Leu Glu Arg Arg Val
 290 295 300
 45 Ala Arg Glu Asp Thr Asp Ile Ala Gly Gln Arg Leu Pro Ala Gly Gly
 305 310 315 320
 Ser Val Val Ile Leu Val Ala Ala Val Asn Arg Ala Pro Val Ser Ala
 325 330 335
 50 Gly Ser Asp Ala Ser Thr Thr Val Pro His Ala Gly Gly Arg Pro Arg
 340 345 350
 55 Thr Ser Ala Pro Ser Val Pro Ser Ala Pro Phe Asp Leu Thr Arg Pro
 355 360 365
 60 Val Ala Ala Pro Gly Pro Phe Gly Leu Pro Gly Asp Leu His Phe Arg
 370 375 380

24/35

Leu Gly Gly Pro Leu Val Gly Thr Val Ala Glu Ala Ala Leu Gly Ala
 385 390 395 400
 5
 Leu Ala Ala Arg Leu Pro Gly Leu Arg Ala Ala Gly Pro Ala Val Arg
 405 410 415
 10
 Arg Arg Arg Ser Pro Val Leu His Gly His Ala Arg Leu Pro Val Ala
 420 425 430
 15
 Val Ala Arg Thr Ala Arg Asp Leu Pro Ala Thr Ala Pro Arg Asn
 435 440 445
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 <210> 14
 <211> 424
 <212> PRT
 <213> Streptomyces eurythermus
 <400> 14
 25
 Met Arg Ile Leu Leu Thr Ser Phe Ala His Asn Thr His Tyr Tyr Asn
 1 5 10 15
 30
 Leu Val Pro Leu Gly Trp Ala Leu Arg Ala Ala Gly His Asp Val Arg
 20 25 30
 35
 Val Ala Ser Gln Pro Ser Leu Thr Gly Thr Ile Thr Gly Ser Gly Leu
 35 40 45
 40
 Thr Ala Val Pro Val Gly Asp Asp Thr Ala Ile Val Glu Leu Ile Thr
 50 55 60
 45
 Glu Ile Gly Asp Asp Leu Val Leu Tyr Gln Gln Gly Met Asp Phe Val
 65 70 75 80
 50
 Asp Thr Arg Asp Glu Pro Leu Ser Trp Glu His Ala Leu Gly Gln Gln
 85 90 95
 55
 Thr Ile Met Ser Ala Met Cys Phe Ser Pro Leu Asn Gly Asp Ser Thr
 100 105 110
 60
 Ile Asp Asp Met Val Ala Leu Ala Arg Ser Trp Lys Pro Asp Leu Val
 115 120 125
 65
 Leu Trp Glu Pro Phe Thr Tyr Ala Gly Pro Val Ala Ala His Ala Cys
 130 135 140
 70
 Gly Ala Ala His Ala Arg Leu Leu Trp Gly Pro Asp Val Val Leu Asn

25/35

	145		150		155		160									
5	Ala	Arg	Arg	Gln	Phe	Thr	Arg	Leu	Leu	Ala	Glu	Arg	Pro	Val	Glu	Gln
				165						170					175	
10	Arg	Glu	Asp	Pro	Val	Gly	Glu	Trp	Leu	Thr	Trp	Thr	Leu	Glu	Arg	His
				180					185					190		
15	Gly	Leu	Ala	Ala	Asp	Ala	Asp	Thr	Ile	Glu	Glu	Leu	Phe	Ala	Gly	Gln
			195					200					205			
20	Trp	Thr	Ile	Asp	Pro	Ser	Ala	Gly	Ser	Leu	Arg	Leu	Pro	Val	Asp	Gly
		210					215					220				
25	Glu	Val	Val	Pro	Met	Arg	Phe	Val	Pro	Tyr	Asn	Gly	Ala	Ser	Val	Val
	225					230					235					240
30	Pro	Ala	Trp	Leu	Ser	Glu	Pro	Pro	Ala	Arg	Pro	Arg	Val	Cys	Val	Thr
				245						250					255	
35	Leu	Gly	Val	Ser	Thr	Arg	Glu	Thr	Tyr	Gly	Thr	Asp	Gly	Val	Pro	Phe
				260					265					270		
40	His	Glu	Leu	Leu	Ala	Gly	Leu	Ala	Asp	Val	Asp	Ala	Glu	Ile	Val	Ala
		275						280					285			
45	Thr	Leu	Asp	Ala	Gly	Gln	Leu	Pro	Asp	Ala	Ala	Gly	Leu	Pro	Gly	Asn
		290					295					300				
50	Val	Arg	Val	Val	Asp	Phe	Val	Pro	Leu	Asp	Ala	Leu	Leu	Pro	Ser	Cys
	305					310					315					320
55	Ala	Ala	Ile	Val	His	His	Gly	Gly	Ala	Gly	Thr	Cys	Phe	Thr	Ala	Thr
				325						330					335	
60	Val	His	Gly	Val	Pro	Gln	Ile	Val	Val	Ala	Ser	Leu	Trp	Asp	Ala	Pro
				340					345					350		
65	Leu	Lys	Ala	His	Gln	Leu	Ala	Glu	Ala	Gly	Ala	Gly	Ile	Ala	Leu	Asp
		355						360					365			
70	Pro	Gly	Glu	Leu	Gly	Val	Asp	Thr	Leu	Arg	Gly	Ala	Val	Val	Arg	Val
		370					375					380				
75	Leu	Glu	Ser	Arg	Glu	Met	Ala	Val	Ala	Ala	Arg	Arg	Leu	Ala	Asp	Glu
	385					390					395					400

26/35

5 Met Leu Ala Ala Pro Thr Pro Ala Ala Leu Val Pro Arg Leu Glu Arg
 405 410 415
 Leu Thr Ala Ala His Arg Arg Ala
 420
 10 <210> 15
 <211> 240
 <212> PRT
 <213> Streptomyces eurythermus
 15 <400> 15
 20 Met Asn Leu Glu Tyr Ser Gly Asp Ile Ala Arg Leu Tyr Asp Leu Val
 1 5 10 15
 His Gln Gly Lys Gly Lys Asp Tyr Arg Ala Glu Ala Glu Glu Leu Ala
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